RP165

A CONVENIENT FORM OF GEIGER TUBE COUNTER

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ABSTRACT

A design of the new Geiger tube counter for detection of gamma radiation or penetrating beta radiation is described which is portable and will maintain its operating characteristics constant over a long period of time.

When used for the detection of gamma radiation, or high velocity beta radiation, the new Geiger [1] tube counter may readily be put in a form that is portable and independent of pumps. This note describes a design which the writer has found very satisfactory.

Figure 1 shows a longitudinal cross section of a completed counter. It consists of a metal tube T fitted with hard rubber bushings E_1 and E_2. Brass bushings in the center of these hard rubber bushings support the small brass rods attached to the two ends of the wire W. The wire W is stretched taut and held by clamping the longer rod attached to it by means of the screw shown threaded into the brass bushing. The opposite end of this clamped rod has a brass button B threaded on to it, carrying a lump of solder as indicated. The parts already described, when fitted together, form the counting chamber proper. On the outside of the tube T is a metal ring R which acts as a stop for the rim of the metal cup C which supports one end of the counter, being fitted to it so that the tube T slides snugly into it. The tungsten wire W_2 is hard soldered into the center of the end of the cup C. In assembling the completed counter the pyrex containing tube P is prepared by sealing in the tungsten wire W, carrying a spiral steel spring S on its inner end. The counter is pushed into the tube until the pointed end of the spring is firmly pressed against the solder button. The pyrex tube is then drawn down at the open end and sealed around the wire W_2, a side tube not shown having been previously sealed on for evacuation. The pyrex tube is evacuated to a pressure of from 1 to 5 cm and sealed off and is ready for use.

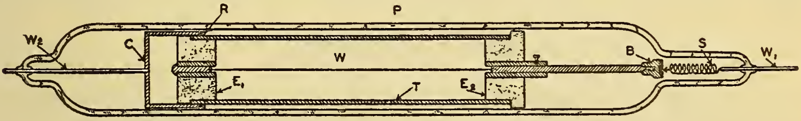

Figure 1.—*Sealed Geiger tube counter inclosed in glass*

It is advisable to include a capsule of a drying agent such as P_2O_5 unless the interior parts can be thoroughly dried before sealing. Water vapor apparently has a harmful effect on the counter and may even render it totally ineffective.

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[1] Geiger, H., and Müller, W., Phys. Z. S., **29**, 839; 1928.